In the claims:

Please add Claims 12 through 23 as follows:

12. A method of processing blocks of samples of digital signals of integer length M comprising processing the digital samples of length M with an invertible linear transform of dimension M, said transform comprising a cascade, using the steps, in arbitrary order, of:

a) at least one +/-1 butterfly step,

b) at least one lifting step with rational complex coefficients, and

c) at least one scaling factor.

13. The method of Claim 12 additionally comprising the step of at least one time delay.

14. The method of claim 12, wherein the rational complex coefficients in the lifting steps are dyadic.

15. The method of claim 12, wherein

a) said invertible transform is an approximation of a biorthogonal transform;

b) said biorthogonal transformation comprises a representation as a cascade of at least one butterfly step, at least one orthogonal transform, and at least one scaling factor;

c) said at least one orthogonal transform comprising a cascade of

ii) at least one +/-1 butterfly step,

iii) at least one planar rotation, and

iv) at least one scaling factor;

d) said at least one planar rotation being represented by equivalent lifting steps and scale factors; and,

e) said approximation being obtained by replacing floating point coefficients in the lifting steps with rational coefficients.

16. The method of claim 15, wherein the coefficients of the lifting steps are chosen to be dyadic rational.

17. The method of claim 12, wherein the invertible transform is a unitary transform.

18. The method of claim 12, wherein

a) said invertible transform is an approximation of a unitary transform;

b) said approximation of the unitary transform comprises a representation of the unitary transform as a cascade of at least one butterfly step, at least one orthogonal transform, and at least one scale factor;

c) said at least one orthogonal transform being represented as a cascade of

(1) at least one +/-1 butterfly steps,

(2) at least one planar rotation, and

(3) at least one scaling factor;

d) said at least one planar rotation being represented by equivalent lifting steps and scale factors; and,

e) said approximation being derived by using approximate rational values for the coefficients in the lifting steps.

19. The method of claim 18, wherein the invertible transform is an approximation of a transform selected from the group of special unitary transforms: discrete cosine transform (DCT); discrete Fourier transform (DFT); discrete sine transform (DST).

20. The method of claim 18, wherein the coefficients of the lifting steps are dyadic rational.

21. The method of claim 18, wherein at least one of the following lifting steps is used, whose matrix representations take on the form: $\begin{bmatrix} 1 & a \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} 1 & 0 \\ b & 1 \end{bmatrix}$, where a, b are selected from the group:

+/- {8, 5, 4, 2, 1, ½, ¼, ¾, 5/4, 1/8, 3/8, 2/5, 5/8, 7/8,1/16, 3/16, 5/16, 7/16, 9/16, 11/16, 13/16, 15/16, 25/16}.

22. The method of claim 21, wherein the invertible transform is an approximation of a transform selected from the group of special unitary transforms: discrete cosine transform (DCT); discrete Fourier transform (DFT); discrete sine transform (DST).

23. The method of claim 22, wherein the approximation of the 4-pt DCT is selected from the group of matrices: